

REMARKS

By the present amendment, independent claims 13 and 29 have been amended to obviate the examiner's objections thereto and/or to further clarify the concepts of the present invention. Claims 1-11, 13-38 and 41-43 are pending in the application. Claims 1-11 have been withdrawn. Entry of these amendments is respectfully requested.

Claims 13-17, 19-31 and 34-38 were rejected under the first paragraph of 35 USC § 112 as failing to comply with the written description requirement. Specifically, it was alleged that the specification did not support (a) the recitation in the claims that the controller is programmed to simultaneously open or operate the first through third valves to continuously and simultaneously supply liquid and discharge gas and liquid, and (b) the recitation that the device operates in a continuous manner without having a continuous supply of liquid. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

In response to the assertion regarding recitation (a), it is submitted that the disclosure at lines 30-34 of page 7; lines 13-15 of page 8; lines 2-9 and 19-22 of page 10; lines 2-13 and lines 3-13 of page 15, when taken together, supports the subject recitation. As to portion (b), it is submitted that the recitations in claims 13 and 29 have been mischaracterized with respect to the controller. The recitations state that, when the

controller operates the first valve to supply the chemical gas to the preparation tank, the controller operates the second valve and the third valve to continuously and simultaneously discharge an adjusted amount of the undissolved chemical gas and a predetermined amount of the chemical solution that is under preparation from the preparation tank. It appears that the examiner has assumed that the controller allows continuous supply chemical gas, not just when the first valve is operated. To clarify this distinction, the last paragraph of these claims has been amended herein.

In view of the foregoing, it is submitted that the subject claims are now in full conformance with the provisions of the cited statute. Accordingly, withdrawal of the rejection under the first paragraph of 35 U.S.C. § 112 is respectfully requested.

Claims 13-17, 19-31 and 34-38 were rejected under the first paragraph of 35 USC § 112 as not being enabled by the specification as filed. The reasons stated for this rejection were basically the same as set forth above with reference to paragraph (a) in the rejection based on the written description requirement. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

It is submitted that the response set forth above also obviates this rejection as well. Accordingly, withdrawal of the rejection under the first paragraph of 35 U.S.C. § 112 is

respectfully requested.

Claims 13-16, 23, 29, 34, 38 and 41-43 were rejected under 35 USC § 103(a) as being unpatentable over the patent to Ginsburgh et al. In addition, claims 13-15 and 23 were rejected under 35 USC § 103(a) as being unpatentable over the patent to Nakajima et al. In making these rejections, it was asserted that the cited patents each teach all the elements of the apparatus as claimed except for the provision of simultaneous computer control of the valves. It was then concluded that such computer control would be obvious to one of ordinary skill in the art. Reconsideration of these rejections in view of the above claim amendments and the following comments is requested.

Before discussing the rejection in detail, a brief review of the presently claimed invention may be quite instructive. The claimed invention is directed generally to a chemical solution preparation apparatus (1) including a chemical solution refinement device (11), which dissolves a chemical gas into a liquid and prepares a refined chemical solution. As shown in Fig. 2, the chemical solution refinement device (11) includes:

- a preparation tank (21) for storing a liquid;
- a first pipe (L4) for supplying the chemical gas into the preparation tank;
- a first valve (35) arranged in the first pipe for opening and closing the first pipe;

a gas discharge pipe (L5) for discharging the chemical gas that was not dissolved in the liquid during the gas dissolving from the preparation tank;

second valve (44) arranged in the gas discharge pipe for opening and closing the gas discharge pipe;

a liquid discharge pipe (L7) for discharging a predetermined amount of the chemical solution from the preparation tank;

a third valve (46) arranged in the liquid discharge pipe for opening and closing the liquid discharge pipe; and

a controller (31) programmed to operate the first, second and third valves.

When the controller operates the first valve to supply the chemical gas to the preparation tank, the controller operates the second valve and the third valve to continuously and simultaneously discharge an adjusted amount of the undissolved chemical gas and a predetermined amount of the chemical solution that is under preparation from the preparation tank. By continuously discharging a predetermined amount of the chemical solution and undissolved chemical gas from the preparation tank during dissolving, impurities can be efficiently eliminated from the preparation tank and a chemical solution essentially free of impurities can be prepared.

It is submitted that none of the cited patents teach or suggest, among other things, an important technical feature of the presently claimed invention that the controller

operates to continuously and simultaneously discharge undissolved chemical gas and a predetermined amount of liquid chemical solution from the preparation tank by controlling the first, second, and third valves so as to prepare an essentially impurity-free chemical solution. The cited patents do not teach the particular feature of the subject controller as discussed previously, particularly with reference to operation of the second valve to discharge an adjusted amount of the undissolved chemical gas. Thus, the Nakajima et al patent and the Ginsburgh et al patent do not teach or suggest, among other things, an apparatus having a controller programmed to operate to continuously and simultaneously discharge undissolved chemical gas and a predetermined amount of liquid chemical solution from the preparation tank. It is therefore submitted that the claims directed to the above as amended herein patentably distinguish over the cited patents, whether taken singly or in combination.

In addition, it is submitted that the cited patents fail to teach or suggest draining a predetermined amount of a chemical solution out of a chemical solution preparation apparatus during gas dissolving. A chemical solution preparation apparatus according to the presently claimed invention is configured to drain a predetermined amount of a chemical solution out of the preparation apparatus during gas dissolving, i.e., during preparation of the chemical solution. Accordingly, the predetermined amount of the chemical solution, such as metals, are not returned to the tank. As a consequence, the impurity amount of the chemical solution is reduced and, therefore, a chemical solution

having a relatively high purity can be prepared.

The Nakajima patent teaches preparation of a chemical solution while circulating the chemical solution. This teaching is the direct opposite to the subject matter of the presently claimed invention. In particular, the Nakajima patent discloses a chemical agent producing device including a circulation system 5 where a solution discharged from a mixing unit 17 is circulated by the circulation system. Of significance is that a predetermined amount of the solution is not drained out during preparation of the solution. A solution discharged from the mixing unit 17 is returned to the mixing unit 17, impurities contained in the solution is also returned to the mixing unit 17. As a consequence, the impurity amount of the solution is not reduced.

The Ginsburgh patent discloses at col. 5, lines 50-54 an apparatus for producing a safety enhanced combustion fuel including an inert gas-enriched fuel distribution means, an outlet control means 46. The distribution means 46 discharges inert gas-enriched fuel as needed. It is to be particularly noted that inert gas-enriched fuel is a final product, not a solution under preparation. In other words, the distribution means 46 distributes inert gas-enriched fuel after preparation of the fuel is completed. Therefore, the Ginsburgh patent fails to teach or suggest discharging a predetermined amount of a fuel out of the apparatus during preparation of inert gas-enriched fuel.

For the reasons stated above, withdrawal of the rejections under 35 U.S.C. §103(a) and allowance of claims 13-16, 20-23, 29-31, 34-38 and 41-43 over the cited patents are respectfully requested.

In addition, claims 20-22, 30-31 and 36 were rejected under 35 USC § 103(a) as being unpatentable over the above patent to Nakajima et al further in view of the '080 Japanese patent publication. Reconsideration of this rejection in view of the above claim amendments and the following comments is requested.

The above remarks relative to the teaching deficiencies of are reiterated with regard to this rejection. It is further submitted that the Japanese patent publication does not supply the teaching deficiencies of the Nakajima et al patent. The Japanese patent publication merely discloses bubbling gas in a liquid. However, the publication does not teach or suggest operating to continuously and simultaneously discharge undissolved chemical gas and a predetermined amount of liquid chemical solution from the preparation tank during a gas-bubbling operation so as to eliminate impurities from the liquid.

For the reasons stated above, withdrawal of the rejections under 35 U.S.C. §103(a) and allowance of claims 20-22, 30-31 and 36 over the cited patents are respectfully requested.

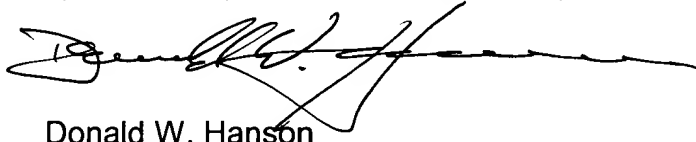
Applicants acknowledge with appreciation the indication that claim 18 is allowed over the cited art. Although not specifically indicated, it is noted that claims 17, 19, 24-28, 35 and 37 were not rejected over the cited art.

In view of the foregoing detailed discussion and the amendments herein, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

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